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(54) Title: PERSONAL WASHING BAR HAVING ADJACENT EMOLLIENT RICH AND EMOLLIENT POOR PHASES

(57) Abstract: The present invention discloses a multiphase cleansing bar having a plurality of phases of cleansing material. Adjacent phases preferably have different concentration levels of benefit components and all the phases individually preferably have a substantially similar cleansing base selected from a syndet base, a soap base, or mixtures thereof. Chemical and rheological compatibility between the phases is maximized and recycling of the product during production is facilitated by the use of a uniform cleansing base. Methods of producing the inventive bar by extruding and melt casting are also disclosed.

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PERSONAL WASHING BAR HAVING ADJACENT
EMOLLIENT RICH AND EMOLLIENT POOR PHASES

The present invention relates to multiphase cleansing bars.

5

It has long been desirable to deliver some form of emollient, moisturizer or nutrient benefit component (e.g., fatty acids, triglycerides, glycerin, petrolatum, or silicone compounds etc.) to the skin through a personal wash composition for moisturization, etc.

In liquid cleansers, for example, cationic hydrophilic polymers such as Polymer JR^(R) from Amerchol or Jaguar^(R) from Rhone Poulenc have been used to enhance delivery of benefit agents (WO 94/03152; and WO 94/03151). In applicants' recently issued U.S. Patent No. 5,965,501 to Rattinger et al., separate emollient droplets act as a structure to entrap the benefit agent in concentrated form.

20 Delivery of benefit agents (e.g., fatty acids, triglycerides, glycerin, silicone compounds etc.) has proven difficult in bar compositions for a number of reasons. If the benefit agent does not remain sufficiently discrete from the other components in the bar composition, for example, 25 the generally hydrophobic benefit agent will interact with the hydrophobic portion of the surfactant compounds in the bar mix rather than be free to deposit on the skin or other substrate. Thus, little or no benefit agent will be free in the final bar (after milling, plodding and extrusion of 30 chips) to be delivered to the skin. Most of the benefit components are liquids and can interact with surfactants to

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form a liquid crystalline phase. Thus the use of a high level of these benefit agents can make the bar soft, which also leads to difficulties in processing.

5 U.S. Patent No. 4,017,574 to Joshi, issued April 12, 1977 discloses a process for making a multicolored soap bar where a coloring agent is dispersed in a meltable solid vehicle and introduced into a base soap material before extrusion to yield a striped soap bar. The meltable solid material may
10 be wax or wax-like and comprise one or more benefit agents with the limitation that the melting point of the solid material is above 100°F and is compatible with the water soluble dye. However, this meltable solid material may not be compatible with the soap base of the bar resulting in
15 cracking and adhesive failure over time.

U.S. Patent No. 5,154,849 to Visscher et al. teaches bar compositions containing a silicone skin mildness/moisturizing aid component as small domains. In
20 one embodiment, the silicone component may be mixed with a carrier which is selected to facilitate incorporation of the silicone in the product. The preferred carrier is said to be polyethylene glycol. The silicone is mixed into melted Carbowax (polyethylene glycol) and cooled to form flakes
25 which are preferably added to an amalgamator with the rest of the formulation ingredients. The carbowax carrier material may not be compatible with the soap base of the bar resulting in rheological and chemical incompatibility.

30 According to the present invention, the benefit agent is distributed in the cleansing bar in adjacent benefit agent

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rich and poor phases. In a preferred embodiment, the phases are situated along the major axis of the cleansing bar as stripes. Each phase or layer preferably has substantially the same cleansing base such as a syndet base, a natural
5 soap base, or a blend thereof and is both rheologically and chemically compatible. Rheological compatibility is herein defined as having similar flow properties under extrusion processing conditions. Chemical or interphase compatibility is herein defined as the absence of interfacial cracking or
10 splitting and having similar wear rates or mush properties between abutting phases. Such interphase compatibility is believed to be due to the similarity in free energy at the surface of the abutting phases.

15 According to prior art methods, the addition of the benefit components to the amalgamator and further processing through the refiners and plodders leads to mixing of the benefit components in the bulk of the formulation. By contrast, the alternating emollient rich and poor phases of the present
20 invention do not get mixed because the two phases are coextruded near the cone at the final plodding stage.

In another embodiment of the invention, the chemically compatible emollient rich and emollient poor phases may be
25 melt cast adjacent to each other.

Whether a result of an extrusion or a casting process, the segregation of the phases or domains may lead to higher deposition of the benefit components during the application
30 of the inventive product. Preferably the cleansing base of the adjacent phases, used for the product, is substantially

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the same, and rheological and interphase compatibility will therefore be maximized.

In the present invention, applicants have unexpectedly found
5 that, when the cleansing base in which the highest
concentration of emollients are found ("emollient rich
phases or layers") is positioned adjacent to a rheologically
and chemically compatible lower emollient concentration
phase or layer of the cleansing bar ("emollient deficient
10 phase or layer"), enhanced deposition of benefit agent
occurs without the disadvantage of phase incompatibility
problems, lather depression and recycling difficulties. The
domains may be in the form of stripes, striations,
alternating blocks, swirling, random distribution of the
15 benefit domains etc. Preferably, the multiphase cleansing
bar will be striped as shown in Figures 1 and 2.

Specifically, the invention comprises a multiphase cleansing
bar comprising:

20

- (a) a plurality of phases of cleansing material;
- (b) each of said cleansing phases being rheologically compatible;
- (c) the plurality of phases having at least one
25 emollient rich phase, at least one emollient
deficient phase, and at least one interface
therebetween;
- (d) the emollient rich phase containing an emollient
composition in the amount of 0.1 to 50 weight %,
30 the emollient deficient phase containing an
emollient composition in the amount of 0 to 25

- 5 -

weight %; wherein the emollient rich phase has a higher total emollient composition concentration compared to the emollient poor phase.

- 5 Preferably, the emollient rich and poor phases will have substantially the same cleansing base selected from a syndet base, a soap base, or a mixture thereof.

Preferably, the emollient composition concentration in the
10 emollient rich layer is 0.5 to 30 weight % of the total cleansing bar, more preferably 1 to 20 weight %. Preferably, the emollient composition concentration in the emollient poor phase is 0 to 10 weight % of the total cleansing bar, more preferably 0 to 5 weight %. Preferably,
15 the emollient composition concentration in the emollient rich phase is 5 times the emollient composition concentration in the emollient poor phase. More preferably the emollient composition concentration in the emollient rich phase is 10 times the emollient composition
20 concentration in the emollient poor phase.

In a preferred embodiment of the invention, the cleansing bar comprises:

- 25 (a) a plurality of layers or phases of a cleansing material;
(b) each of the cleansing layers having a substantially uniform cleansing base selected from a syndet base, a soap base, or mixtures thereof;
30 (c) the plurality of layers having alternating emollient rich layers and emollient poor layers;

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- (d) the emollient rich layers uniformly containing an emollient composition in an amount from 0.1 to 50 weight %, the emollient poor layers uniformly containing an emollient composition in an amount from 0 to 5 weight %; wherein the emollient rich layers have at least 2 times the emollient composition concentration compared to the emollient poor layers.

The surfactant system or cleansing base may be a pure soap surfactant system having tallowate and/ or vegetable oil soaps such as palmate, cocoate, palmkernelate, any other vegetable oil soap or a mixture of these at any ratio. Preferably the tallowate/cocoate blend is used in a ratio of 90/10 to 50/50, more preferably in a ratio of 90/10 to 60/40. Preferably the vegetable oil is selected from palm oil, coconut oil, palm kernal oil, palm stearin, or hydrogenated rice bran oil.

The surfactant system also may comprise a synthetic detergent system ("syndet"). Preferably the syndet system comprises:

- (a) a first synthetic surfactant which is an anionic surfactant; and/ or
- (b) a second surfactant selected from a second anionic surfactant different from the first, a nonionic, an amphoteric and mixtures thereof.

A particularly preferred syndet surfactant system comprises acyl isethionate as the first anionic and a sulfosuccinate or a betaine surfactant, or mixtures of the two, as the

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second surfactant. Alternatively, the surfactant system may be a blend of pure soap and synthetic surfactants.

In accordance with these and other aspects of the invention,
5 the invention will now be described with reference to the accompanying drawings.

Figure 1 is a top planar view showing one embodiment of a multiphase cleansing bar of the present invention.

10

Figure 2 is a cross section taken along line 6 - 6 of Figure 1.

Figure 1 shows a multiphase cleansing bar 10 with
15 alternating emollient rich layers 4, and emollient poor layers 2 separated by an interface 12. Also depicted in Figure 1 is major axis line 8 - 8 and minor axis line 6 - 6 of the multi-layer soap bar 10.

20 Figure 2 shows a cross section taken along line 6 - 6 of Figure 1.

In this embodiment of the inventive multiphase cleansing bar, the cleansing base of the emollient rich layer 4 is
25 substantially the same as the adjacent, emollient poor layer 2. The ratio of the width of the emollient rich layer 4 to the emollient poor layer 2 is preferably 1 to 20, more preferably 1 to 5.

30 In comparison to the cleansing bar of the present invention, enhanced deposition is not seen for cleansing bars in which

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emollient is simply added during the mixing, milling and/or refining steps without segregating the emollient into emollient rich phases or layers. By segregating the emollient rich phase from the emollient poor phase, it is believed that the emollient is less available to interact with surfactants in the bar and is therefore more able to deposit on the skin or other substrate during application. This segregation also helps to keep a hydrophobic benefit component apart from the other major functional components of the formulation. In this way, the benefit component will be less likely to negatively impact on desired user properties, such as lather.

The emollient containing compositions may also comprise structuring aid/filler, free fatty acid and/or water.

The invention will now be described in further detail below.

COMPOSITION OF EMOLLIENT RICH PHASE

20

Benefit Agent

The emollient or benefit agent of the present invention may be a single benefit agent component, or may be a benefit agent compound added alone or via a carrier into the process stream. Further the benefit agent may be a mixture of two or more compounds, one or all of which may have a beneficial aspect. In addition, the benefit agent itself may act as a carrier for other components one may wish to add to the bar composition.

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The benefit agent may be an "emollient oil" by which is meant a substance which creates a barrier on the skin (stratum corneum) and reduces the excessive water loss, maintaining the skin soft and moist.

5

Preferred emollients include:

- (a) silicone oils, gums and modifications thereof such as linear and cyclic polydimethylsiloxanes, amino, alkyl alkylaryl and aryl silicone oils;
- 10 (b) fats and oils including natural fats and oils such as jojoba, soybean, rice bran, avocado, almond, olive, sesame, persic, castor, coconut, mink oils, cacao fat, beef tallow, lard, hardened oils obtained by hydrogenating the aforementioned oils,
- 15 and synthetic mono, di and triglycerides such as myristic acid glyceride, 2-ethylhexanoic acid glyceride and ricinoyl monomaleate triglyceride.
- (c) waxes such as carnauba, spermaceti, beeswax, lanolin and derivatives thereof;
- 20 (d) hydrophobic plant extracts;
- (e) hydrocarbons such as liquid paraffins, petrolatum, microcrystalline wax, ceresin, squalene, and pristan.
- (f) higher fatty acids such as lauric, myristic,
- 25 palmitic, stearic, behenic, oleic, linoleic, linolenic, lanolic, isostearic and poly unsaturated fatty acids (PUFA);
- (g) higher alcohols such as lauryl, cetyl, stearyl, oleyl, behenyl, cholesterol and 2-hexyldecanol
- 30 alcohol;

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- (h) esters such as cetyl octanoate, benzyl laurate, myristyl lactate, cetyl lactate, isopropyl myristate, myristyl myristate, isopropyl palmitate, isopropyl adipate, butyl stearate, 5 decyl oleate, cholesterol isostearate, glycerol monostearate, glycerol distearate, glycerol tristearate, alkyl lactate, alkyl citrate and alkyl tartrate;
- (i) essential oils such as mentha, jasmine, camphor, 10 white cedar, bitter orange peel, ryu, turpentine, cinnamon, bergamot, citrus unshiu, calamus, pine, lavender, bay, clove, hiba, eucalyptus, lemon, starflower, thyme, peppermint, rose, sage, menthol, cineole, eugenol, citral, citronelle, 15 borneol, linalool, geraniol, evening primrose, camphor, thymol, spirantol, penene, limonene and terpenoid oils;
- (j) lipids such as cholesterol, ceramides, sucrose esters and pseudo-ceramides as described in 20 European Patent Specification No. 556,957;
- (k) vitamins such as vitamin A and E, and vitamin alkyl esters, including those vitamin C alkyl esters;
- (l) sunscreens such as octyl methoxyl cinnamate 25 (Parsol MCX) and butyl methoxy benzoylmethane (Parsol 1789);
- (m) phospholipids; and
- (n) silicone compounds such as dimethicones, cyclomethicones, silanols, silicone surfactants, 30 modified silicone compounds with hydrocarbon chains. Especially preferred silicone emollients

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include: dimethicones having a viscosity greater than about 50,000 centipoise and polydimethylsiloxane having a viscosity of about 60,000 centistokes.

- 5 (o) hydroxyacids and their salts or esters;
 (p) mixtures of any of the foregoing components.

Other Components

- 10 Water comprises 0 to 20% by weight of the inventive cleansing bar, preferably 0 to 12%.

In addition the emollient rich phase may comprise 0 to 45%, preferably 5 to 25% fatty acid, for example a C₈ to C₂₄ fatty
15 acid. Generally, these include straight or branched chain, saturated or unsaturated fatty acids but are not necessarily limited to these.

The phases may additionally comprise a structuring aid
20 and/or filler which may be a fatty acid as described above or ester derivative thereof; more preferably straight and saturated C₈ to C₂₄ alcohol or ether derivatives.

CLEANSING BASE

25

The bars of the invention also comprise a cleansing base which comprises surfactants, structuring aid/filler, free fatty acid and water.

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The surfactant system comprises about 5% to 90% by wt. of the inventive cleansing bar wherein the surfactant is selected from soap (pure soap surfactant systems are included), anionic surfactant, nonionic surfactant, 5 amphoteric/zwitterionic surfactant, cationic surfactant and mixtures thereof.

Surfactant System

10

The term "soap" is used herein in its normal sense, i.e., the alkali metal or alkanol ammonium salts of aliphatic alkane- or alkene monocarboxylic acids. Sodium, potassium, mono-, di- and tri-ethanol ammonium cations, or combinations 15 thereof, are suitable for the purposes of the present invention. In general, sodium soaps are used in the compositions of the present invention, but from about 1% to about 25% of the soap may be ammonium, potassium, magnesium, calcium or a mixture of these soaps. The soaps useful 20 herein are the well known alkali metal salts of aliphatic (alkanoic or alkenoic) acids having about 12 to 22 carbon atoms, preferably about 12 to about 18 carbon atoms. They may be described as alkali metal carboxylates of acrylic hydrocarbons having about 12 to about 22 carbon atoms.

25

Soaps having the fatty acid distribution of coconut oil may provide the lower end of the broad molecular weight range. Those soaps having the fatty acid distribution of peanut or rapeseed oil, or their hydrogenated derivatives, may provide 30 the upper end of the broad molecular weight range.

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It is preferred to use soaps having the fatty acid distribution of tallow, and vegetable oil. More preferably the vegetable oil is selected from palm oil, coconut oil, palm kernal oil, palm stearin, and hydrogenated rice bran oil or mixtures thereof, since these are among the more readily available fats. Especially preferred is coconut oil. The proportion of fatty acids having at least 12 carbon atoms in coconut oil soap is about 85%. This proportion will be greater when mixtures of coconut oil and fats such as tallow, palm oil, or non-tropical nut oils or fats are used, wherein the principle chain lengths are C₁₆ and higher. A preferred soap for use in the compositions of this invention has at least about 85% fatty acids having about 12-18 carbon atoms.

15

Coconut oil employed for the soap may be substituted in whole or in part by other "high-alluric" oils, that is, oils or fats wherein at least 50% of the total fatty acids are composed of lauric or myristic acids and mixtures thereof. These oils are generally exemplified by the tropical nut oils of the coconut oil class. For instance, they include: palm kernel oil, babassu oil, ouricuri oil, tucum oil, cohune nut oil, murumuru oil, jaboty kernel oil, khakan kernel oil, dika nut oil, and ucuhuba butter.

20

A preferred soap is a mixture of about 15% to about 20% coconut oil and about 80% to about 85% tallow. These mixtures contain about 95% fatty acids having about 12 to about 18 carbon atoms. As mentioned above, the soap may

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preferably be prepared from coconut oil, in which case the fatty acid content is about 85% of C₁₂-C₁₈ chain length.

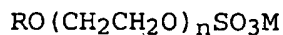
The soaps may contain unsaturation in accordance with commercially acceptable standards. Excessive unsaturation is normally avoided.

Soaps may be made by the classic kettle boiling process or modern continuous soap manufacturing processes wherein natural fats and oils such as tallow or coconut oil, or their equivalents, are saponified with an alkali metal hydroxide using procedures well known to those skilled in the art. Alternatively, the soaps may be made by neutralizing fatty acids, such as lauric (C₁₂), myristic (C₁₄), palmitic (C₁₆), or stearic (C₁₈) acids with an alkali metal hydroxide or carbonate.

The anionic detergent active which may be used may be aliphatic sulfonates, such as a primary alkane (e.g., C₈-C₂₂) sulfonate, primary alkane (e.g., C₈-C₂₂) disulfonate, C₈-C₂₂ alkene sulfonate, C₈-C₂₂ hydroxyalkane sulfonate or alkyl glyceryl ether sulfonate (AGS); or aromatic sulfonates such as alkyl benzene sulfonate.

The anionic may also be an alkyl sulfate (e.g., C₁₂-C₁₈ alkyl sulfate) or alkyl ether sulfate (including alkyl glyceryl ether sulfates). Among the alkyl ether sulfates are those having the formula:

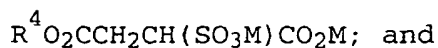
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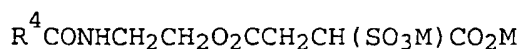
wherein R is an alkyl or alkenyl having 8 to 18 carbons, preferably 12 to 18 carbons, n has an average value of greater than 1.0, preferably greater than 3; and M is a solubilizing cation such as sodium, potassium, ammonium or substituted ammonium. Ammonium and sodium lauryl ether sulfates are preferred.

The anionic may also be alkyl sulfosuccinates (including mono- and dialkyl, e.g., C₆-C₂₂ sulfosuccinates); alkyl and acyl taurates, alkyl and acyl sarcosinates, sulfoacetates, C₈-C₂₂ alkyl phosphates and phosphates, alkyl phosphate esters and alkoxyl alkyl phosphate esters, acyl lactates, C₈-C₂₂ monoalkyl succinates and maleates, sulphoacetates, alkyl glucosides and acyl isethionates.

Sulfosuccinates may be monoalkyl sulfosuccinates having the formula:



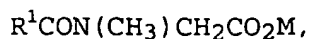
amide-MEA sulfosuccinates of the formula;



wherein R⁴ ranges from C₈-C₂₂ alkyl and M is a solubilizing cation.

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Sarcosinates are generally indicated by the formula:



5 wherein R^1 ranges from C_8 - C_{20} alkyl and M is a solubilizing cation.

Taurates are generally identified by formula:



wherein R^2 ranges from C_8 - C_{20} alkyl, R^3 ranges from C_1 - C_4 alkyl and M is a solubilizing cation.

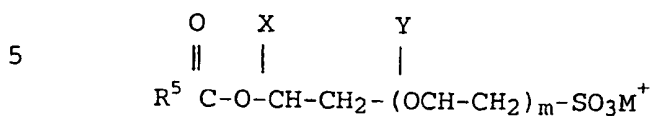
15 Particularly preferred are the C_8 - C_{18} acyl isethionates. These esters are prepared by reaction between alkali metal isethionate with mixed aliphatic fatty acids having from 6 to 18 carbon atoms and an iodine value of less than 20. At least 75% of the mixed fatty acids have from 12 to 18 carbon
20 atoms and up to 25% have from 6 to 10 carbon atoms.

Acyl isethionates, when present, will generally range from about 10% to about 70% by weight of the total bar composition. Preferably, this component is present from
25 about 30% to about 60%.

The acyl isethionate may be an alkoxyated isethionate such as is described in Ilardi *et al.*, U.S. Patent No. 5,393,466,

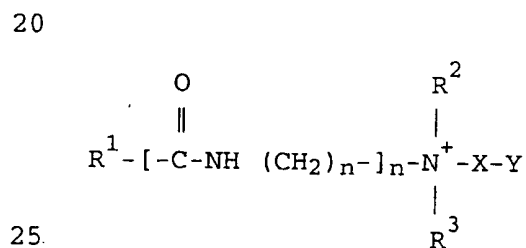
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hereby incorporated by reference. These compounds have the general formula:



wherein R⁵ is an alkyl group having 8 to 18 carbons, m is an integer from 1 to 4, X and Y are hydrogen or an alkyl group having 1 to 4 carbons and M⁺ is a monovalent cation such as, for example, sodium, potassium or ammonium.

Amphoteric detergents which may be used in the present invention include at least one acid group, for example a carboxylic or a sulphonic acid group. Amphoteric detergents include quaternary nitrogen and are, therefore, quaternary amido acids. They should generally include an alkyl or alkenyl group having 7 to 18 carbon atoms and usually comply with an overall structural formula:



where R¹ is alkyl or alkenyl having 7 to 18 carbon atoms;

R² and R³ are each independently alkyl, hydroxyalkyl or carboxyalkyl having 1 to 3 carbon atoms;

m is 2 to 4;

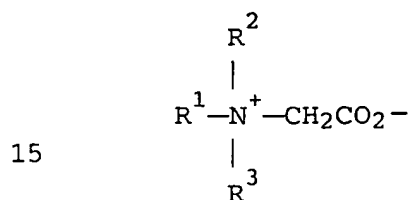
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n is 0 to 1;

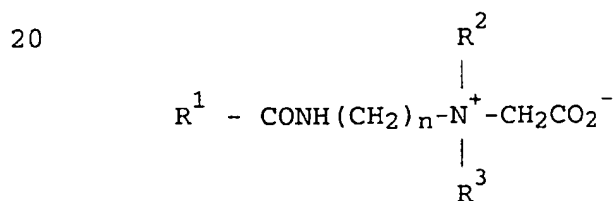
X is alkylene of 1 to 3 carbon atoms optionally
5 substituted with hydroxyl, and

Y is -CO₂- or -SO₃-

Suitable amphoteric detergents within the above general
10 formula include simple betaines of formula:



and amido betaines of formula:



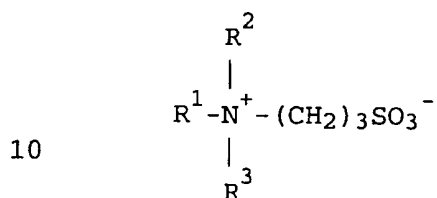
where m is 2 or 3.

In both formulae R¹, R² and R³ are as defined previously. R¹
may, in particular, be a mixture of C₁₂ and C₁₄ alkyl groups
30 derived from coconut so that at least half, preferably at

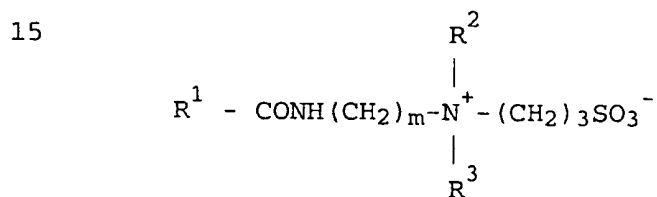
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least three quarters of the groups R^1 have 10 to 14 carbon atoms. R^2 and R^3 are preferably methyl.

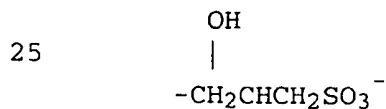
A further possibility is that the amphoteric detergent is a
5 sulphobetaine of formula:



or



where m is 2 or 3, or variants of these in which
- $(CH_2)_3 SO_3^-$ is replaced by



In these formulae R^1 , R^2 and R^3 are as described previously.

30 The nonionic surfactant which may be used as the second component of the invention include, in particular, the reaction products of compounds having a hydrophobic group and a reactive hydrogen atom, for example aliphatic

- 20 -

alcohols, acids, amides or alkylphenols with alkylene oxides, especially ethylene oxide either alone or with propylene oxide. Specific nonionic detergent compounds are alkyl (C₆-C₂₂) phenols ethylene oxide condensates, the
5 condensation products of aliphatic (C₈-C₁₈) primary or secondary linear or branched alcohols with ethylene oxide, and products prepared by condensation of ethylene oxide with the reaction products of propylene oxide and ethylenediamine. Other so-called nonionic detergent
10 compounds include long chain tertiary amine oxides, long chain tertiary phosphine oxides and dialkyl sulphoxides.

The nonionic may also be a sugar amide, such as a polysaccharide amide. Specifically, the surfactant may be
15 one of the lactobionamides described in U.S. Patent No. 5,389,279 to Au et al. or it may be one of the sugar amides described in Patent No. 5,009,814 to Kelkenberg, herein incorporated by reference.

20 Examples of cationic detergents are the quaternary ammonium compounds such as alkyltrimethylammonium halogenides.

Other surfactants which may be used are described in U.S. Patent No. 3,723,325 to Parran Jr. and "Surface Active
25 Agents and Detergents" (Vol. I & II) by Schwartz, Perry & Berch, both of which are also herein incorporated by reference.

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Although the bar may be a pure soap bar, preferably the surfactant system of this chip (forming the surfactant system in the bar) comprises:

- (a) a first synthetic anionic surfactant; and/or
- 5 (b) a second surfactant selected from a second anionic surfactant which is different from the first, a nonionic, an amphoteric or mixtures thereof.

The first anionic surfactant may be any of those recited
10 above, but is preferably a C₈ to C₁₈ isethionate. More preferably, acyl isethionate will comprise 10% to 90% by wt. of the total bar composition.

The second surfactant is preferably a sulfosuccinate, a
15 betaine, any other surfactant or a mixture of two or more of these surfactants. The second surfactant or mixture of surfactant will generally comprise 1% to 20% by wt. of the total bar composition. A particularly preferred composition comprises enough sulfosuccinate to form 3-10% by wt. of the
20 total bar compositions and enough betaine to form 1-5% by wt. of the total bar composition.

The cleansing base also comprises 0 to 20% water, preferably
0 to 12% by wt. water.

25

The cleansing base may further comprise 0.1 to 80% by wt., preferably 5% to 75% by wt. of a structuring aid and/or inert filler. Such structurants can be used to enhance the bar integrity, improve the processing properties, and
30 enhance desired user sensory profiles.

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The structurant is generally a long chain, preferably straight and saturated, (C₈-C₂₄) fatty acid or ester derivative thereof; and/or branched long chain, preferably straight and saturated, (C₈-C₂₄) alcohol or ether derivatives
5 thereof.

A preferred bar structurant is polyalkylene glycol having a molecular weight between 2000 and 20,000, preferably between 3000 and 10,000. The PEGs are commercially available, such
10 as those marketed under the tradename of CARBOWAX SENTRY PEG8000^(R) or PEG4000^(R) by Union Carbide.

Other ingredients which can be used as structurants or fillers include starches, preferably water soluble starches
15 such as maltodextrin and polyethylene wax or paraffin wax.

Structuring aids may also be selected from water soluble polymers chemically modified with hydrophobic moiety or moieties, for example, EO-PO block copolymer,
20 hydrophobically modified PEGs such as POE(200-glyceryl-stearate, glucam DOE 120 (PEG Methyl Glucose Dioleate), and Hodg CSA-102 (PEG-150 stearate), and Rewoderm^(R) (PEG modified glyceryl cocoate, palmate or tallowate) from Rewo Chemicals.

25

Other structuring aids which may be used include Amerchol Polymer HM 1500 (Nonoxynyl Hydroethyl Cellulose).

Inert fillers which may be used in the formulations are
30 clays such as talc, kaolin, bentonites, zeolites.

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Processing

Extruded Bars:

In general, the chips defining the cleansing base are formed by mixing the ingredients of the bar phase in a mixer at a
5 temperature of about 30°C to 110°C for 1 to 60 minutes, then cooling in a chill roll mill to obtain flakes.

The emollient rich phase is made separately by mixing the benefit components along with the base and other minor
10 components in a mixer at a temperature of about 30°C to 110°C for 3 to 60 minutes, then cooling in a chill roll mill to obtain flakes.

The emollient rich and poor phases are separately refined
15 and plodded in such a way that the two phases meet each other near the cone in the final plodder to give well separated stripes. The billets are then cut, stamped, and packed.

20 In an alternative method the emollient rich components may be added in the vacuum chamber of the plodder and extruded along with the emollient poor phase to obtain striations.

Melt Cast Process:

25 In the melt cast process, the emollient rich and emollient poor phases are made separately by melting the phase components between 60-120°C. The two melts are poured in molds in such a way that the two or more phases are segregated. The phases may be in the form of stripes,
30 swirls, one phase by the side of the other etc. The molds

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may be cast in pack or separate molds, which are cooled to obtain solid bars.

Inventive multiphase soap base cleansing bars having the compositions listed in Tables 1 and 2 may be prepared. The cleansing bar of Table 1 is typically prepared by an extrusion process and the cleansing bar of Table 2 is typically prepared by a melt-cast process as described above. The soap base may have the fatty acid distribution and use any of the emollient, pigments, chelating agents etc. previously described. One or more phases may also be transparent, translucent, or contain particles or beads.

Table 1

Extrudable Formulation			
Component	Total Formula	Emollient Rich Layer	Emollient Poor Layer
Soap Base (80/20 with 12% Water)	96.0597	90.459	98.46
Tetrasodium EDTA	0.02	0.02	0.02
Tetrasodium EHDP	0.02	0.02	0.02
Titanium Dioxide	0.50	0.50	0.50
Perfume	1.00	1.00	1.00
Petrolatum	1.20	4.00	0.0
Bee Wax	0.90	3.00	0.0
Glycerin	0.30	1.00	0.0
Colorant	0.0003	0.001	0.0
	100.00	100.00	100.00

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Table 2

Melt Cast Formulation			
Component	Total Formula	Emollient Rich Layer	Emollient Poor Layer
Soap Base (60/40)	46.4597	39.459	49.46
Water	20.0	20.0	20.0
Propylene Glycol	20.0	20.0	20.0
TEA	10.0	10.0	10.0
Titanium Dioxide	0.50	0.50	0.50
Tetrasodium EDTA	0.02	0.02	0.02
Tetrasodium EHDP	0.02	0.02	0.02
DC 200	1.20	4.0	0.0
Petrolatum	0.90	3.0	0.0
Coconut Oil	0.90	3.0	0.0
Colorant	0.0003	0.001	0.0
	100.0	100.0	100.0

The following examples are intended to further illustrate
5 the invention and are not intended to limit the invention in
any way.

Unless stated otherwise, all percentages are intended to be
percentages by weight.

10

EXAMPLE 1

A multiphase cleansing bar having the formula in Table 3 was
prepared. The phases were extruded as layers oriented along
15 the major axis of the bar, and were visually distinguished
by coloration in this example although coloration is
optional. The emollient rich layers comprised 30% of the
bar and were colored blue and the emollient poor layers
comprised the remainder of the bar and were colored white.

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Table 3

Formulation Details:

Component	Total Formulation	Emollient Rich Layer	Emollient Poor Layer
Sodium cococyl isethionate	49.422	42.352	52.452
Sodium tallowate/cocoate	6.98	6.7	7.1
Water	4.94	4.8	5.0
Sodium isethionate	4.64	4.5	4.7
Coconut Fatty Acid	3.07	3.0	3.1
Sodium stearate	2.97	2.9	3.0
Cocoamidopropyl betaine	2.77	2.7	2.8
Fragrance	1.00	1.000	1.0
Sodium chloride	0.20	0.200	0.2
Titanium dioxide	0.17	0.100	0.2
Tetrasodium edta	0.02	0.020	0.02
Trisodium etidronate	0.02	0.020	0.02
BHT	0.008	0.007	0.008
Colorant	0.0	0.001	0.0
Stearic acid	20.10	19.400	20.4
Coconut Oil	1.8	6.000	0.0
Petrolatum	1.8	6.000	0.0
Tocopherol acetate	0.09	0.300	0.0
total	100.0	100.0	100.0

5

EXAMPLE 2

A multiphase cleansing bar having the formula in Table 4 was
 10 prepared. The phases were extruded as layers oriented along
 the major axis of the bar, and were visually distinguished
 by coloration in this example although coloration is
 optional. The emollient rich layers comprised 75% of the
 bar and were colored pink and the emollient poor layers
 15 comprised the remainder of the bar and were colored white.

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Process Description:

White and Pink bases are made separately.

5 • Emollient Rich Phase- The color was dissolved in perfume.
The color may also be optionally added in coconut oil and
sunflower oil. The perfume mix and the benefit components
were added in a mixer along with the rest of the
10 ingredients and mixed. This mixed mass was passed through
the refiner.

• Emollient Poor Portion- The perfume was added to the
remainder of the base and mixed in a mixer. This mass was
also passed through the refiner.

15

The two formulations were co-extruded in such a way that the
emollient rich phase was extruded directly near the cone of
the final plodding stage to obtain stripes. The number of
stripes and the width of the stripes may be varied depending
20 upon the requirement.

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Table 4

Formulation Details:

Syndet Base Composition:	Total Formulation	Emollient Rich Layer	Emollient Poor Layer
Sodium cococyl isethionate	50.653	50.052	52.452
Stearic acid	19.65	19.4	20.4
Sodium tallowate/cocoate	6.8	6.7	7.1
Water	4.85	4.8	5.0
Sodium isethionate	4.55	4.5	4.7
Coconut acid	3.025	3.0	3.1
Sodium stearate	2.925	2.9	3.0
Cocoamidopropyl betaine	2.725	2.7	2.8
Sunflower seed oil	2.475	3.3	0.0
Fragrance	1.0	1.0	1.0
Lanolin alcohol	0.525	0.7	0.0
Tocopherol acetate	0.225	0.3	0.0
Glycerin	0.225	0.3	0.0
Sodium chloride	0.2	0.2	0.2
Titanium dioxide	0.125	0.1	0.2
Tetrasodium edta	0.02	0.02	0.02
Trisodium etidronate	0.02	0.02	0.02
BHT	0.007	0.007	0.008
D&C red #17	0.0	0.001	0.0
total	100.0	100.0	100.0

While this invention has been described with respect to particular embodiments thereof, it is apparent that numerous other forms and modifications of the invention will be obvious to those skilled in the art. The appended claims and this invention generally should be construed to cover all such obvious forms and modifications.

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CLAIMSWe claim

- 5 1. A multiphase cleansing bar comprising:
- (a) a plurality of phases of cleansing material;
 - (b) each of the cleansing phases being rheologically
compatible with each other;
 - 10 (c) the plurality of phases having at least one
emollient rich phase and emollient deficient
phase, and at least one interface therebetween;
 - (d) the at least emollient rich phase containing an
emollient composition in an amount from 0.1 to 50
15 weight %, the at least one emollient deficient
phases uniformly containing an emollient
composition in an amount from 0 to 10 weight %;
and wherein the at least one emollient rich phase
has at least 2 times the emollient composition
20 concentration compared to the at least one
emollient poor phase.
2. A cleansing bar according to claim 1 wherein each of
the cleansing phases have substantially the same
25 cleansing base selected from a syndet base, a soap
base, or mixtures thereof.
3. A cleansing bar according to claim 1 or claim 2,
wherein the emollient rich phases have at least 10
30 times the emollient composition of the emollient poor
phases.

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4. A cleansing bar according to any of the preceding claims further comprising:
- 5 (a) cleansing phases having substantially the same cleansing base selected from a syndet base, a soap base, or mixtures thereof;
- (b) the cleansing phases having alternating emollient rich phases and emollient deficient phases;
- 10 (c) the emollient rich phases containing an emollient composition in an amount from 0.1 to 50 weight %, the emollient poor phases containing an emollient composition in an amount from 0 to 25 weight %; and wherein the emollient rich phases have at
- 15 least 2 times the emollient composition concentration compared to the emollient poor phases.
5. A cleansing bar according to any of the preceding claims, wherein the surfactant system comprises:
- 20 (a) a first synthetic anionic surfactant; and
- (b) a second surfactant selected from a second anionic surfactant different from the first, a nonionic surfactant, an amphoteric surfactant or mixtures
- 25 thereof.
6. A cleansing bar according to claim 5, wherein the first anionic surfactant is an acyl isethionate.

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7. A cleansing bar according to claim 6, wherein the second surfactant is selected from a salt of a fatty acid, a sulfosuccinate, a betaine or a mixture thereof.
- 5 8. A cleansing bar according to any of the preceding claims, wherein the soap base comprises alkali metal salts of fatty acids derived from tallow and vegetable oil.
- 10 9. A cleansing bar according to claim 8 wherein the vegetable oil is selected from palm oil, coconut oil, palm kernel oil, palm stearin, and rice bran oil.
- 15 10. A process for making a multiphase cleansing bar according to claim 1 comprising simultaneous coextrusion of the emollient rich and emollient poor phases to obtain separate stripes thereof.
- 20 11. A process for making a multi-phase cleansing bar according to claim 1 comprising melt-casting of the phases to get separate stripes of emollient rich and emollient poor phases.

1/1

Fig.1.

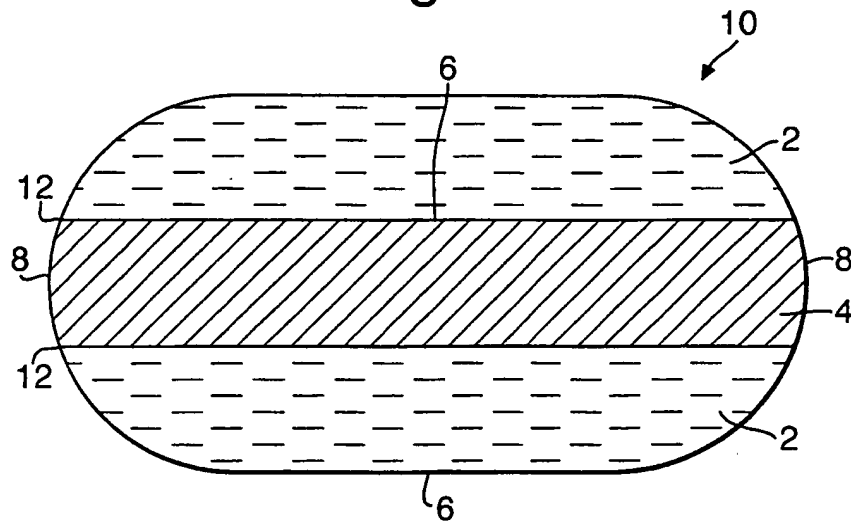
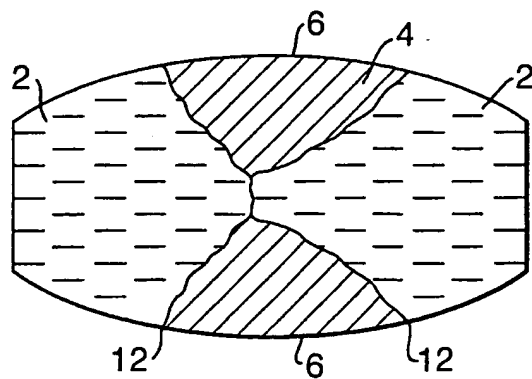


Fig.2.



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(54) Title: PERSONAL WASHING BAR HAVING ADJACENT EMOLLIENT RICH AND EMOLLIENT POOR PHASES

(57) Abstract: The present invention discloses a multiphase cleansing bar having a plurality of phases of cleansing material. Adjacent phases preferably have different concentration levels of benefit components and all the phases individually preferably have a substantially similar cleansing base selected from a syndet base, a soap base, or mixtures thereof. Chemical and rheological compatibility between the phases is maximized and recycling of the product during production is facilitated by the use of a uniform cleansing base. Methods of producing the inventive bar by extruding and melt casting are also disclosed.

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☒ Further documents are listed in the continuation of box C.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
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